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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,085	03/25/2004	Feng Liang	FGT 3G4 (81099482)	9750

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KOLISCH HARTWELL, PC  
200 PACIFIC BUILDING  
520 SW YAMHILL STREET  
PORTLAND, OR 97204

EXAMINER

RIDDLE, KYLE M

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/811,085	Applicant(s) LIANG ET AL.	
	Examiner Kyle M. Riddle	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-21, 24 and 25 is/are rejected.
- 7) ☒ Claim(s) 22 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>04162004, 08192004</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Controller 12 cited on page 8, lines 5-6, 19, 29, page 9, lines 3, 4, 9, 27, and page 10, line 2 is not designated in the drawings. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

3. Claim 8 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 6.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3, 5-8, 10-15, 21, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et al. (U.S. Patent 4,152,570).

Re claims 1, 3, 5, 10, 11, 14, 21, and 24, Inoue et al. disclose a drive assembly comprising:

- a plurality of electromagnets 11A-11D with coils and having a core or conical member 10 (column 3, lines 14-21);

- an armature or disk plate 8 attached to a shaft 5 axially movable through the core or conical member 10 (column 2, lines 64-68 and Figure 1);

- the conical member 10 having a permanent magnet piece 7 angled relative to the axial movement of the shaft with ends extending below the coils and toward the plate 8 with an inner

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part of the magnet 7 being closer to a center of the core or conical member 10 than an outer part of the magnet 7 (column 2, lines 58-63 and Figure 1);

- the permanent magnet piece 7 contained within the interior portion of the coils (Figure 1);

- the combination of the electromagnets permanent magnet piece 7 increasing the magnetic properties of the device to insure multi-directional uniformity and desired displacement of the shaft (column 1, lines 36-47).

Re claims 6-8, 15, and 25, Inoue et al. disclose an air or magnetic gap G adjacent the curved or conical shaped permanent magnet piece 7, the core 10 separating the coil and gap G (column 3, lines 12-15, lines 57-65, and Figure 1).

Re claim 12, Inoue et al. disclose the angle of the permanent magnet piece 7 being between 5 and 85 degrees (Figure 1).

Re claim 13, Inoue et al. disclose the permanent magnet piece 7 extending fully along a height of the coils (Figure 1).

6. Claims 1-3, 5, 11, 12, 14, 17, 18, 20, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Guerin et al. (EP 1174595 A1).

Re claims 1, 3, 5, 11, 14, 17, 18, 20, and 24, Guerin et al. disclose a valve actuator comprising:

- a pair of electromagnets 60, 61 with coils or reels 63, 64 and core or polar parts 65, 66, 67, 68 (see translation, paragraphs 79-81 and Figure 3);

- permanent magnets 69, 70 inclined at an angle to the shaft or valve stem 76 and surrounded by the coils or reels 63, 64 (paragraph 81 and Figure 3);

- an armature or pallet 75 fixed to the valve stem 76 extending through the core or polar parts 65, 66, 67, 68 and axially movable to actuate an engine valve 77 of an internal combustion engine (paragraph 84 and Figure 3);

- the use of the angled permanent magnets 69, 70 with the electromagnets 60, 61 increasing the magnetic properties of the actuator and reducing losses (paragraphs 87-93).

Re claim 2, Guerin et al. disclose rectangular shaped permanent magnets 69, 70 (Figure 3).

Re claim 12, Guerin et al. disclose the permanent magnets 69, 70 being inclined between 5 and 85 degrees (Figure 3).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being obvious over Inoue et al. or Guerin et al.

Inoue et al. and Guerin et al. disclose devices with electromagnets, coils, a shaft with an armature, and permanent magnets inclined at an angle to the shaft. They, however, fail to disclose a particular cross-sectional shape or layering of the permanent magnets. The V-shaped cross-sectional design of the permanent magnets or the inclusion of multiple layers of magnetic material in creating the permanent magnets would have been obvious to one having ordinary skill in the art depending on space requirements, flux densities, and manufacturing

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considerations. Moreover, there is nothing in the record which establishes that the application of such a cross-section or layering represents a novel or unexpected result (See *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975)).

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being obvious over Guerin et al.

Guerin et al. disclose the valve actuator cited above, however, fail to disclose other valves of the engine being cam actuated. It is well known in the art to actuate intake or exhaust valves by means of camshafts and cams. Guerin et al. discloses a valve actuator to actuate any engine cylinder valve 77 (paragraph 84). The addition of actuating the intake valves only with the actuator of Guerin et al. and cam actuating the exhaust valves would have been obvious to one having ordinary skill in the art depending on timing and lift characteristics, space constraints, performance results, etc. Moreover, there is nothing in the record which establishes that the combination of cam actuated and electromagnetically actuated valves represents a novel or unexpected result (See *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975)).

#### ***Allowable Subject Matter***

10. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

11. The IDS (PTO-1449) filed on 16 April 2004 and 19 August 2004 has been considered. An initialized copy is attached hereto.

#### ***Communication***

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle M. Riddle whose telephone number is (703) 306-3409, and effective 22 November 2004 will be (571) 272-4864. The examiner can normally be reached on M-F (07:30-5:00) Second Friday Off.

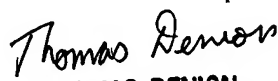
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859 effective 22 November 2004. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kyle M. Riddle  
Examiner  
Art Unit 3748

kmr



THOMAS DENION  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700